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(58) Field of search

C5D

(54) Decontaminant wash composition

(57) A wash for removing skin contaminants such as cobalt-60 comprises an alkyl dimethyl betaine, a non-ionic surfactant and water. In the exemplified composition, the betaine and the non-ionic surfactant are mixed in equal proportions with a larger volume of distilled water and the resulting wash was found to be capable of decontaminating pork skin of cobalt-60 contaminant.

SPECIFICATION

Decontaminant wash composition

5 DESCRIPTION 5

The present invention relates to a wash particularly for removing very obstinate residues from the skin.

The removal of contaminants from the human skin can be extremely difficult in the case of substances which do not dissolve readily in solvents which are not themselves harmful or which cannot be lifted by known, safe surfactants in appropriate compositions. Considerable research has therefore gone into developing specific washes for particular contaminants but there are still many residues, including in particular radioactive residues such as cobalt-60, which require prolonged soaking and scrubbing for their removal. 10

The object of the present invention is to provide an improved decontaminant wash, particularly but not exclusively for removing radioactive residues from the skin. 15

Accordingly, the invention provides a decontaminant wash comprising an aqueous solution of an alkyl dimethyl betaine and a nonionic surfactant.

It has been found that the combination of the ampholytic alkyl dimethyl betaine (ADB) with a nonionic surfactant which may be constituted by a polyoxyalkylene condensate of a linear fatty alcohol, an alkyl phenol ethoxylate or an alcohol, amine or ester ethoxylate is effective in proportions of from substantially 0.15% to 100% by weight of a mixture of the two reagents ADB solution and surfactant in distilled water to 100%. More particularly, in tests carried out with variations of the composition of the mixture it was found that mixtures containing ADB solution and surfactant in a 20:70 weight ratio were effective as washes but the effectiveness increased markedly as this ratio neared 50:50; indeed, a 50:50 mixture was substantially four times as effective as a 20:70 mixture and substantially three times as effective as a 40:60 mixture. 20 25

Further tests have shown that the effectiveness of washes according to the invention containing a mixture of ADB solution and surfactant in a 50:50 by weight ratio increased as the strength of the solution was increased. As indicated above, washes containing as little as 0.15% by weight of the mixture in water to 100% are effective but a quantity of the mixture of the order of 0.3% is preferred. 30

It should also be noted that the wash of the present invention has the added advantage of being an aqueous liquid whereas many cleansers in current use are creams or greases. After use these latter must be washed off the skin, thereby adding to the time needed to remove contamination whereas the wash of the invention is effectively self-rinsing and is safe for use on the human body. 35

A wash according to the invention may be used at room temperature. It is effective at all temperatures but has been found to be particularly effective in a warm atmosphere. The wash does not require heating. It may also be used with beneficial effect on skin burns. 40

Tests carried out with one particular embodiment of the invention will now be more particularly described, by way of example.

EXAMPLE

45 Decontaminant wash 45

Ingredient	% by weight	
aqueous alkyl dimethyl betaine	0.15	
polyoxyalkylene condensate of		
a linear fatty alcohol	0.15	50
distilled water	99.7	

The above contaminant wash according to the invention and a known wash for cobalt-60 were tested for their effectiveness in removing cobalt-60 residues from pork skin by the following method. 55

Samples of the pork skin were contaminated with an aqueous solution containing cobalt-60 and radiation counts were effected on the samples with the use of a shielded sodium iodide crystal.

Respective contaminated samples were then wiped with filter papers soaked in the washes and the radiation counts were again taken. The samples were then soaked in the respective washes and scrubbed, radiation counts being taken after various stages. Results of the counts are given below. 60

Results

5	Cleansing Operation	Residual Co-60 activity expressed as a percentage of the applied activity		5
		Decontamination wash of the invention	Known decontamination wash	
	1st Wipe	90%	100%	
10	2nd Wipe	70%	100%	
	3rd Wipe	65%	80%	10
	Soaking and scrubbing	50%	80%	
15	2nd soaking and scrubbing	50%	80%	15
20	Final soaking and scrubbing	30%	45%	20

NOTE: The results above may only be regarded as estimates due to the significant uncertainties in source geometry and the difficulties encountered in ensuring that the cleaning techniques were consistent for each decontaminant.

The results show that the wash according to the present invention was more effective than the known wash both when used for simple wiping with a filter paper and for removing contamination more securely fixed to the skin for which soaking and scrubbing were required.

In the example given above the constituents actually used were proprietary products which are commercially available. The polyoxyalkylene condensate of a linear fatty alcohol used was one sold under the trade name of TEXAFOR V 27 by A.B.M. Chemicals and the aqueous dimethyl betaine was one sold under the trade name AMBITERIC D 40, again by A.B.M. Chemicals.

CLAIMS

1. A decontaminant wash composition comprising an alkyl dimethyl betaine, a non-ionic surfactant and water.
2. A composition as claimed in Claim 1 wherein the alkyl dimethyl betaine and the non-ionic surfactant are present in a combined amount of at least 0.15% by weight based on the betaine, non-ionic surfactant and water combined.
3. A composition as claimed in Claim 2 wherein the alkyl dimethyl betaine and the non-ionic surfactant are present in a combined amount of about 0.3% by weight based on the betaine, non-ionic surfactant and water combined.
4. A composition as claimed in Claims 1 to 3 wherein the alkyl dimethyl betaine and the non-ionic surfactant are present in a weight ratio to each other from 20:70 to 50:50.
5. A composition as claimed in Claim 4 wherein the alkyl dimethyl betaine and the non-ionic surfactant are present in a weight ratio to each other of from 40:60 to 50:50.
6. A composition as claimed in any preceding claim wherein the non-ionic surfactant is a polyoxyalkylene condensate of a linear fatty alcohol, an alkyl phenol ethoxylate or an alcohol, amine or ester ethoxylate.
7. A decontaminant wash composition comprising a non-ionic surfactant and an aqueous alkyl dimethyl betaine, the betaine and non-ionic surfactant being present in a weight ratio of 20:70 to 50:50 and the total combined amount of the betaine and the non-ionic surfactant being at least 0.15% of the composition, the betaine being expressed as betaine sold under the trade mark AMBITERIC D 40.
8. A decontaminant wash composition substantially as hereinbefore described in the specific Example.
9. A prophylactic treatment method to be applied to the epidermal surfaces of a human or non-human animal subject, wherein the said subject has a decontaminant wash composition as claimed in any preceding claim administered to an epidermal surface and a mechanical cleansing operation optionally applied thereto thereafter.
10. An alkyl dimethyl betaine in admixture with a non-ionic surfactant for dilution with water to form a decontaminant wash composition.

11. A product containing the components alkyl dimethyl betaine and non-ionic surfactant and optionally distilled water or other aqueous component as a combined preparation for concurrent use of the separate components to achieve decontamination of a contaminated epidermal surface of a human or non-human animal.

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